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TE-2

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CNL Assignment - 6

Q.1. What's socket ? Explain system calls related to UDP socket.

→ Socket:

Its an endpoint of two-way communication link b/w two progress running on network. The socket mechanism provides a means of interprocess communication (IPC) established by named contact points b/w which communication takes place. They're generally used in client server applications.

System calls related to UDP sockets:

1) int socket (int domain, int type, int protocol);
creates an unbound socket in specified domain. Returns socket file descriptor.
- Arguments
  domain : specifies communication domain
  type : type of socket
  protocol : 0 means default

2) int bind (int socketfd, const struct sockaddress * addr, socketlen_t addrlen);
Assign address to unbound socket.
Arguments:
  sockfd : file descriptor of socket
  addr : struct in which address to be binded to is specified.
  addrlen : size of addr struct.

3) ssize_t sendto(int sockfd, const void *buf, size_t len, int flags, const struct sockaddr * dest_addr, socklen_t, addrlen);
sends a message on socket.

- Arguments:
  sockfd: file descriptor of socket
  buf: Appl^n buffer containing data to be sent
  len: size of buf
  flags: Bitwise OR of flags to modify socket behaviour
  addrlen: size of dest_addr struct
  dest_addr: struct containing addr of destination.

4) ssize_t recvfrom(int sockfd, void * buf, size_t len, int flags, struct sockaddr * src_addr, ~~src_addr~~ socklen_t * addrlen)

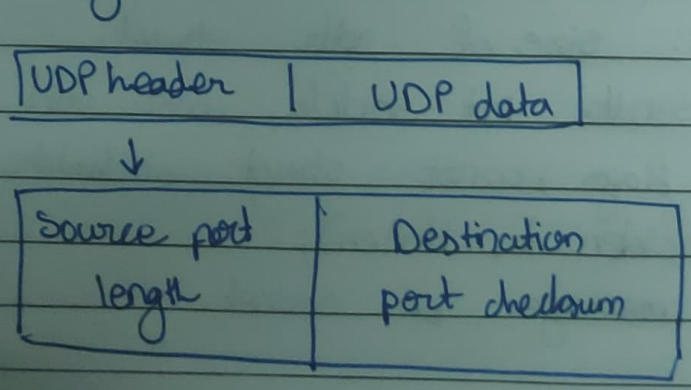
Receives a message from socket.

- Arguments:
  buf: Appn buf to receieve data
  src_addr: source addr struct
  * remaining fields are same as above.

5) int close(int fd); closes a descriptor
  - Arguments: fd: file descriptor.

Q.2. Draw and explain UDP header:

→ UDP header is 8 bytes fixed & simple header; first 8 bytes contain all necessary header information & remaining part comprises data. UDP port no. fields are each 16 bits long, therefore range for port nos is 0 - 65535; port no. 0 is reserved.



1) Source Port: Source port is 2 bytes. Identifies source port number
2) Dest. port: Its 2 bytes long & indentified dest. port number
3) Length: Its UDP length including header & data.
4) Checksum: Its a 2 byte field containing 16-bits 1's complement of the 1's complement checksum of UDP header; pseudo header of info. from IP header & data, padded with 0 octates at the end (if necessary) to make multiple of 2 octates.

Q2) Write down steps involved in establishing UDP socket on client side & server side.

→ Step involved in UDP server-client connection:

- UDP server:

1) Create UDP socket
2) Bind the socket to server addr
3) Wait until datagram packet arrives from client
4) Process the datagram packet & send a reply to client
5) Go to step 3 & continue.

- UDP client:

1) Create UDP socket
2) send message to server
3) Wait until responses from server is received
4) Process reply & go back to step2, if required
5) close socket descriptor & exit.